

FS50KMJ-3

High-Speed Switching Use
Nch Power MOS FET

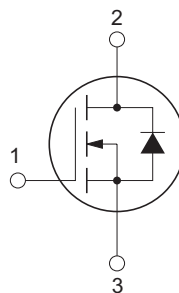
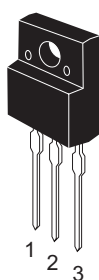
REJ03G1421-0200
(Previous: MEJ02G0082-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 4 V
- V_{DSS} : 150 V
- $r_{DS(ON)(max)}$: 30 m Ω
- I_D : 50 A
- Integrated Fast Recovery Diode (TYP.) : 125 ns
- Viso : 2000 A

Outline

RENESAS Package code: PRSS0003AB-A
(Package name: TO-220FN)



1. Gate
2. Drain
3. Source

Applications

Motor control, Lamp control, Solenoid control, DC-DC converters, etc.

Maximum Ratings

(T_c = 25°C)

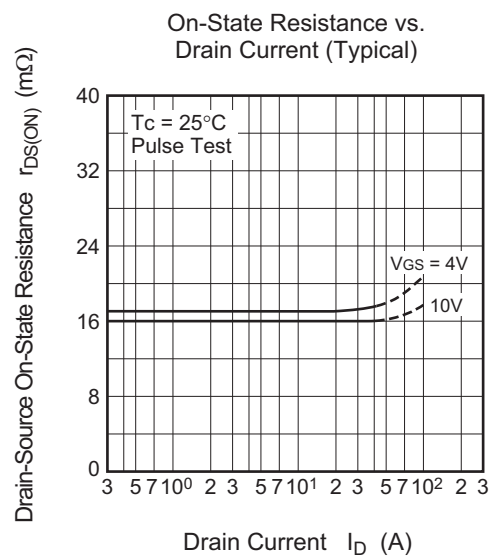
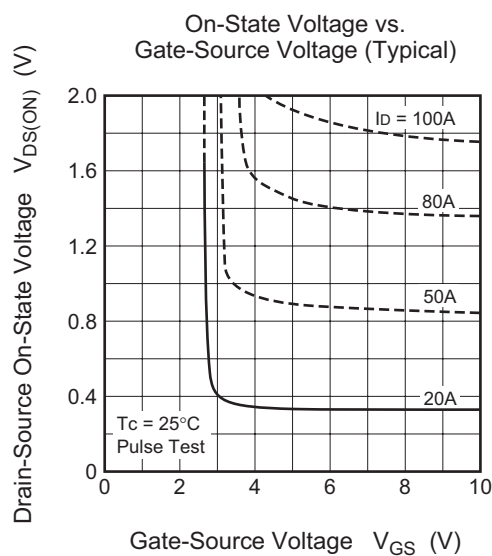
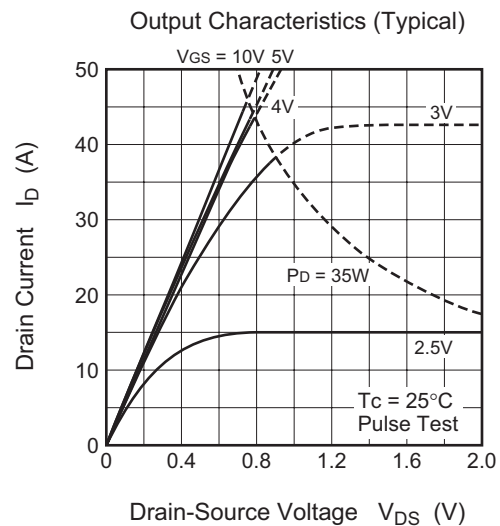
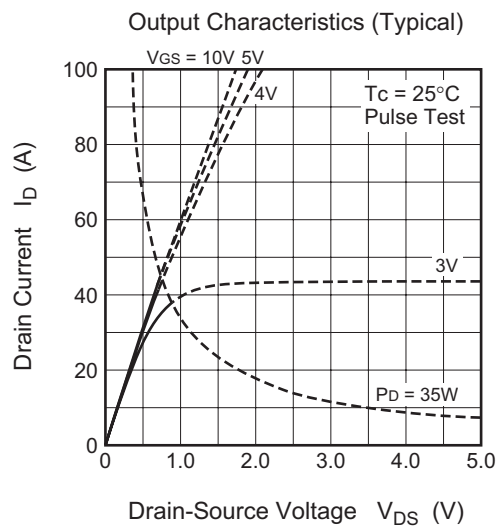
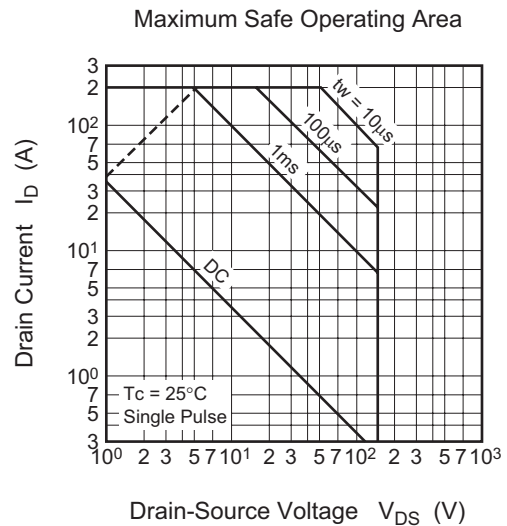
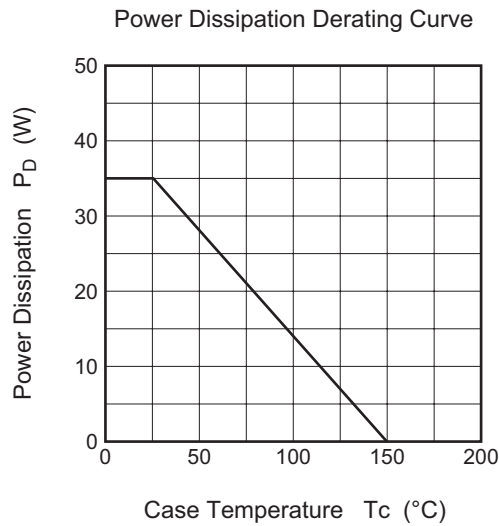
Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	150	V	$V_{GS} = 0$ V
Gate-source voltage	V_{GSS}	±20	V	$V_{DS} = 0$ V
Drain current	I_D	50	A	
Drain current (Pulsed)	I_{DM}	200	A	
Avalanche drain current (Pulsed)	I_{DA}	50	A	L = 100 μ H
Source current	I_S	50	A	
Source current (Pulsed)	I_{SM}	200	A	
Maximum power dissipation	P_D	35	W	
Channel temperature	T _{ch}	– 55 to +150	°C	
Storage temperature	T _{stg}	– 55 to +150	°C	
Isolation voltage	Viso	2000	V	AC for 1 minute, Terminal to case
Mass	—	2.0	g	Typical value

Electrical Characteristics

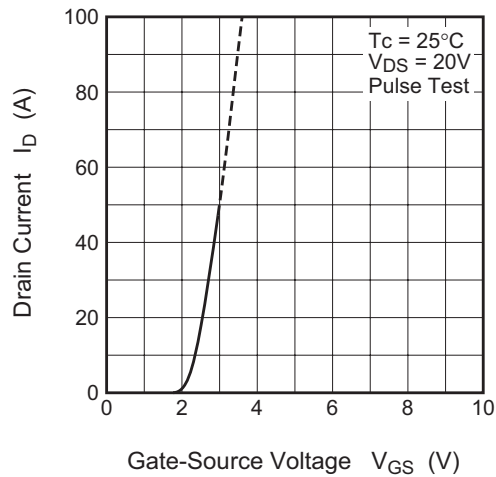
(Tch = 25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 1 \text{ mA}$, $V_{GS} = 0 \text{ V}$
Gate-source leakage current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$
Drain-source leakage current	I_{DSS}	—	—	0.1	mA	$V_{DS} = 150 \text{ V}$, $V_{GS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	1.0	1.5	2.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(on)}$	—	23	30	$\text{m}\Omega$	$I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(on)}$	—	24	31	$\text{m}\Omega$	$I_D = 25 \text{ A}$, $V_{GS} = 4 \text{ V}$
Drain-source on-state voltage	$V_{DS(on)}$	—	0.58	0.75	V	$I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	62	—	S	$I_D = 25 \text{ A}$, $V_{DS} = 10 \text{ V}$
Input capacitance	C_{iss}	—	8200	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	870	—	pF	
Reverse transfer capacitance	C_{rss}	—	440	—	pF	
Turn-on delay time	$t_{d(on)}$	—	54	—	ns	$V_{DD} = 80 \text{ V}$, $I_D = 25 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \Omega$
Rise time	t_r	—	110	—	ns	
Turn-off delay time	$t_{d(off)}$	—	850	—	ns	
Fall time	t_f	—	340	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	$I_S = 25 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	3.57	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	t_{rr}	—	125	—	ns	$I_S = 50 \text{ A}$, $dI_S/dt = -100 \text{ A}/\mu\text{s}$

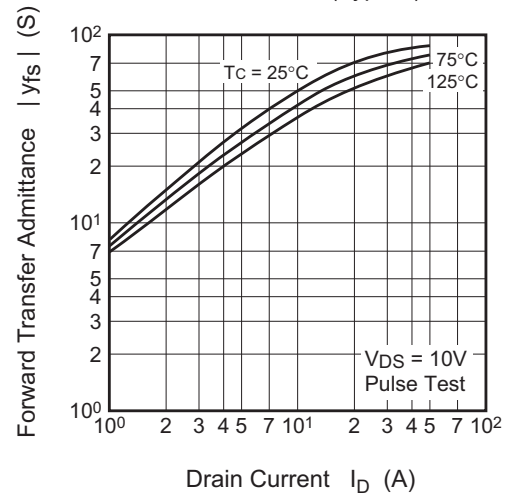
Performance Curves



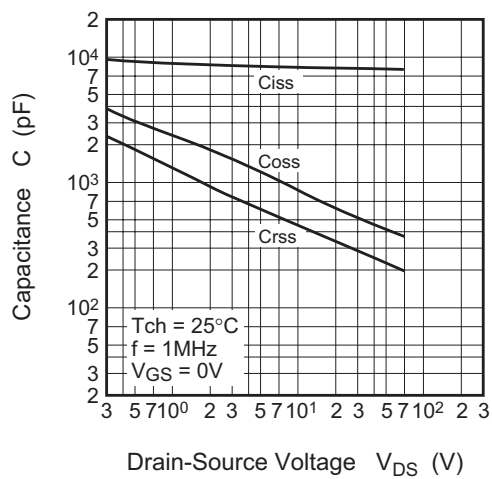
Transfer Characteristics (Typical)



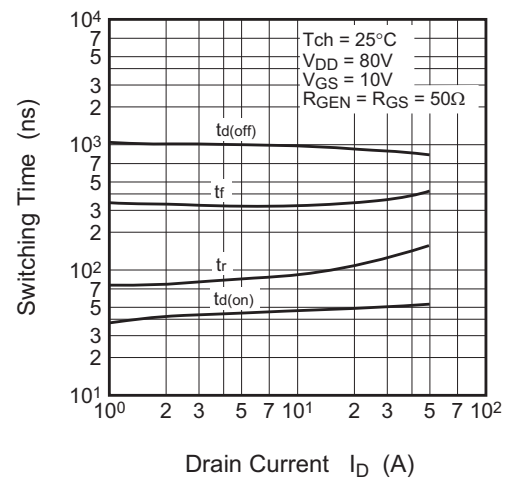
Forward Transfer Admittance vs. Drain Current (Typical)



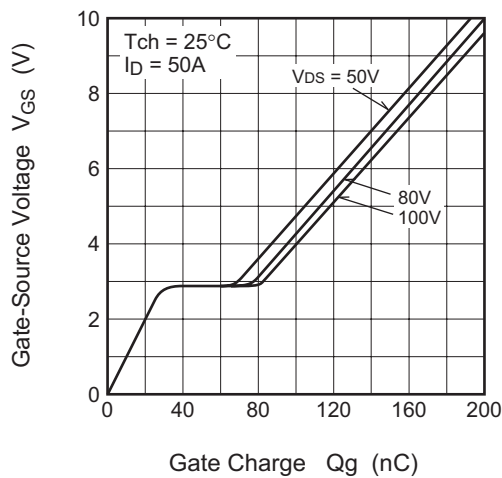
Capacitance vs. Drain-Source Voltage (Typical)



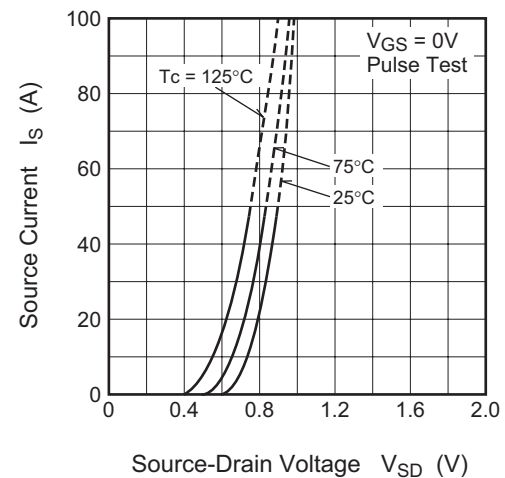
Switching Characteristics (Typical)

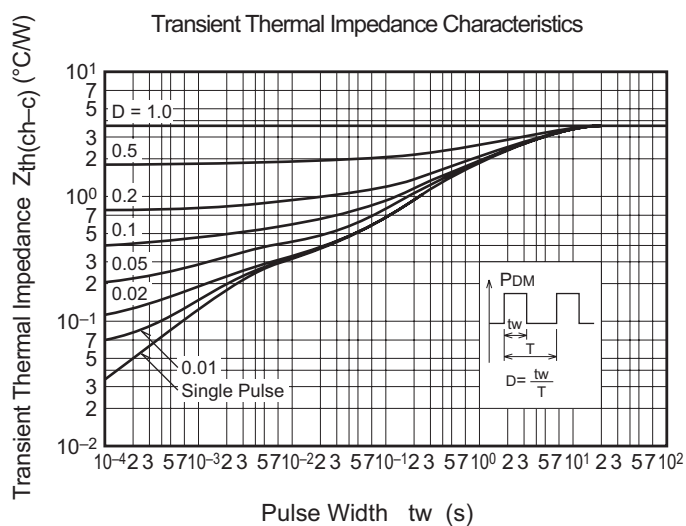
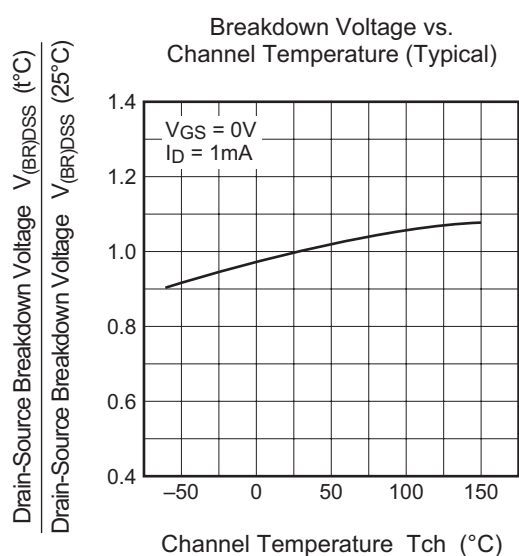
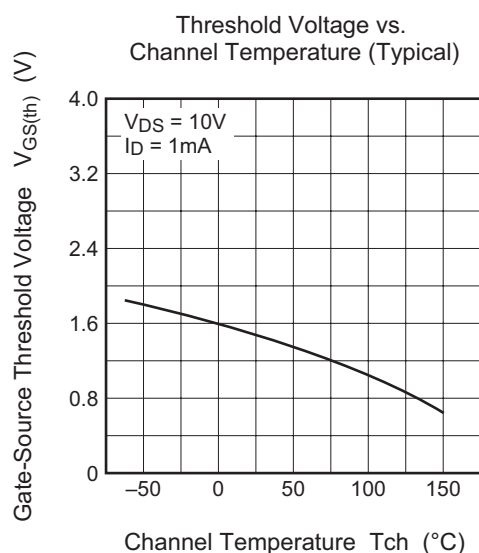
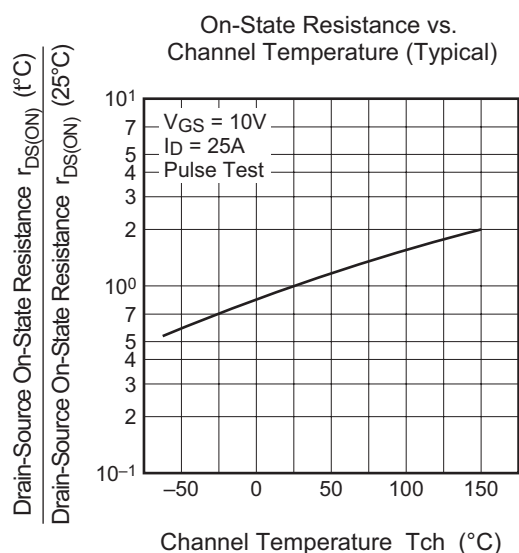


Gate-Source Voltage vs. Gate Charge (Typical)

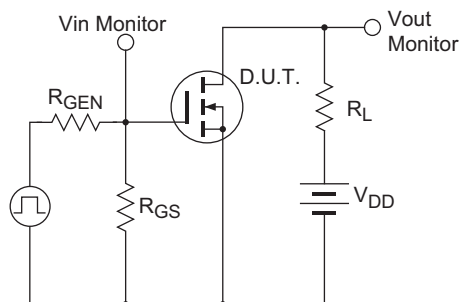


Source-Drain Diode Forward Characteristics (Typical)

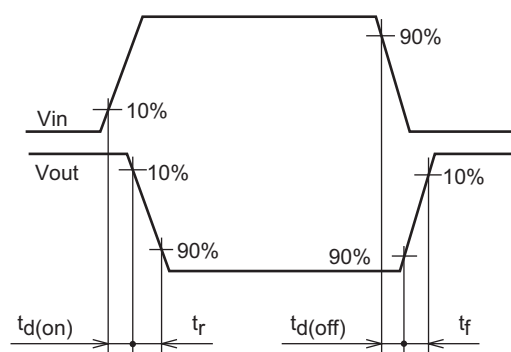




Switching Time Measurement Circuit



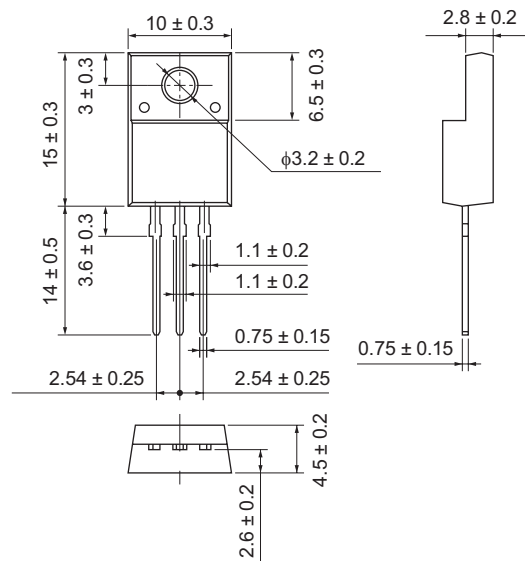
Switching Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FN	—	PRSS0003AB-A	—	2.0g

Unit: mm



Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	FS50KMJ-3
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FS50KMJ-3-A8

Note : Please confirm the specification about the shipping in detail.

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